

## ABSTRACT

In producing an oxygen reduction catalyst including a nitrogen-containing active carbide by converting either a mixture of a carbonaceous solid raw material (coal-derived binder pitch) and a nitrogen-containing organic compound (melamine or the like) or a nitrogen-containing organic polymer compound (polyacrylonitrile, melamine resin or the like) into a powdery material, baking the powdery material, and subjecting the baked product to steam activation, the presence ratio of nitrogen and the presence ratio of carbon relating to a shake-up process in the surface and the spin density of unpaired electrons showing Curie paramagnetism are controlled to be high, by selection of the baking temperature, the mixing ratio between the carbonaceous solid raw material and the nitrogen-containing organic compound, or the nitrogen-containing organic polymer compound material. In incorporating the catalyst into an electrochemical device, the catalyst and an ion conductive polymer are mixed and a catalyst layer is formed from the mixture so as to make smooth the movement of ions and electrons, and, in applying the catalyst to a polymer electrolyte type fuel cell, an MEA is produced. This makes it possible to provide a catalyst comprised of a nitrogen-containing

active carbide and a production method thereof, and an electrochemical device using the catalyst.